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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

LD

Office Action Summary	Application No. 09/703,755	Applicant(s) GRATE ET AL.	
	Examiner Sin J. Lee	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 6-8, 12-19, 25-31, 38-42, 44, 166, 168 and 169 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 103, 104, 106, 147-151, 153, 154, 202-204, 208-211, 221, 230 and 231 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 9-11, 20-24, 43, 45, 46, 48-50, 101, 205, 212, 213, 215-218, 220, 222-229 and 232-247 is/are rejected.
- 7) ☒ Claim(s) 219 is/are objected to.
- 8) ☒ Claim(s) See Continuation Sheet are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 1,2,4,6-31,38-46,48-50,101,103,104,106,147-151,153,154,166,168,169,202-205,208-213 and 215-247.

Continuation of Disposition of Claims: Claims subject to restriction and/or election requirement are 1,2,4,6-31,38-46,48-50,101,103,104,106,147-151,153,154,166,168,169,202-205,208-213 and 215-247.

DETAILED ACTION

1. Upon reconsideration, previous 103(a) rejection (see Paragraph 9 of the last Office action) on claims 48-50, 101, and 212 over Oxman et al'886 in view of Mura et al'718 is hereby withdrawn; Murai's epoxy-functional siloxane compounds do not contain any silicon hydride group or carbon-carbon multiple bond, and thus it is the Examiner's position that treating Oxman's substrate surface with Mura's epoxy-functional siloxane compounds would not append to the surface reactive groups that can participate in hydrosilylation reactions as presently required in claim 48 .
2. In view of the amendment of October 22, 2004, previous 102(b) rejection on claims 103, 106, 147, 148 (see Paragraph 5 of the last Office action) over Cavezzan'065, previous 103(a) rejection on claim 104 (see Paragraph 7 of last Office action) over Cavezzan'065 in view of Oxman et al'886, and previous 103(a) rejection on claims 149-151, 153, 154, 202, 203, and 212 (see Paragraph 8 of the last Office action) over Cavezzan'065 in view of Oxman'886 and Sachdev'693 are hereby withdrawn. The amended claims 103 and 149 now require the active step of "using the chemically selective sorbent film by exposing the film to a first chemical species that the film will selectively absorb", and Cavezzan'065 does not teach or suggest such a step.
3. In view of the newly found prior art, previously indicated allowability of present claims 215-220 are hereby withdrawn, and the following rejections are made *non-final*.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 2, 4, 9-11, 20-24, 43, 45, 46, 205, 212, 213, 222, 223, 226, and 227 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, applicants recite, "wherein the substrate and the film together are operable as an *analytical device*". There is no proper support in the original disclosure for "an analytical device"; although there is support for "a chemical sensor, a separation membrane, a solid phase extraction device and a chromatograph, there is no support for the generic term "an analytical device".

In claim 223, applicants recite "a separation device." Although there is a support for a separation membrane, there is no support in the original disclosure for the generic term "a separation device".

6. Claims 48-50, 101, 224, 225, 228, and 229 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 48, applicants recite, "wherein the substrate and the film together are operable as an *analytical device*". There is no proper support in the original disclosure

for “an analytical device”; although there is support for a chemical sensor, a separation membrane, a solid phase extraction device and a chromatograph, there is no support for the generic term “an analytical device”.

In claim 225, applicants recite “a separation device.” Although there is a support for a separation membrane, there is no support in the original disclosure for the generic term “a separation device”.

7. Claims 236-239 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 236 and 238 recite “providing an analytical device made by . . .” There is no proper support in the original disclosure for “an analytical device”; although there is support for a chemical sensor, a separation membrane, a solid phase extraction device and a chromatograph, there is no support for the generic term “an analytical device”.

8. Claims 240-243 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 240, applicants recite, “selecting a design for an analytical device” and “manufacturing an analytical device according to the design”. Also, in claim 243,

applicants recite, "designing an analytical device to have a predetermined functionality". There is no proper support in the original disclosure for the generic term "an analytical device". *Also, there is no proper support in the original disclosure for the step of pre-selecting a design for the device and manufacturing the device according to the design.*

9. Claims 244-247 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 244, applicants recite, "selecting a design for an analytical device" and "manufacturing an analytical device according to the design". Also, in claim 247, applicants recite, "designing an analytical device to have a predetermined functionality". There is no proper support in the original disclosure for the generic term "an analytical device". *Also, there is no proper support in the original disclosure for the step of pre-selecting a design for the device and manufacturing the device according to the design.*

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

11. Claims 1, 4, 9-11, 20-24, 43, 46, 205, 222, 223, 226, and 227 are rejected under 35 U.S.C. 102(b) as being anticipated by Cavezzan et al (4,939,065).

Cavezzan teaches (col.1, lines 8-12. col.4, lines 15-38, Example 1) a UV-crosslinkable organopolysiloxane composition containing diorganopolysiloxane having

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at least 2 alkenyl unsaturation, which can be located at the end of the polymer chain. Specifically in Example 1, Cavezzan uses a polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups (which is the polymer also used in present Example 1). Therefore, Cavezzan teaches present second precursor molecule of claims 1, 4, 9-11, and 205.

Cavezzan's organopolysiloxane composition also contains (col.3, line 37-62, col.4, lines 53-68, col.5, lines 1-6) a second component, an organohydropolysiloxane containing at least two hydrogen atoms bonded to a silicon atom wherein the SiH groups may be located within the polymer chain, and as one of only three examples, Cavezzan lists *polydimethylpolymethylhydrosiloxane copolymers* having trimethylsiloxyl end groups. Since there are only a few examples, one of ordinary skill in the art would immediately envisage the polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxyl end groups (which is the polymer also used in present Example 1) as Cavezzan's second component. Therefore, the prior art teaches present first precursor molecule of claims 1, 20-24, and 205.

Cavezzan's organopolysiloxane composition finally contains a platinum catalyst (col.3, lines 37-62, col.5, lines 45-56). Therefore, the prior art teaches present photoactivatable catalyst of claims 1 and 205.

Cavezzan teaches (col.3, lines 37-41) that his invention features, as a negative resist, a film-forming organopolysiloxane composition capable of being crosslinked by *hydrosilylation* in the presence of a catalyst derived from a platinum group metal. Cavezzan furthermore teaches (col.7, lines 59-68, col.8, lines 1-16, lines 42-50) that his

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substrate (e.g., silicon wafer) is coated with a uniform adherent film of his organopolysiloxane composition, and then the film formed is imagewise irradiated with UV radiation which will cause the exposed area to cure (thereby decreasing the solubility of the exposed area as presently recited in claim), while the unirradiated area remains soluble in organic solvents.

Since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are also used in the embodiment of present Example 1, it is the Examiner's position that Cavezzan's film-forming organopolysiloxane composition that contains those components as well as the platinum catalyst (present photoactivatable catalyst) will *inherently* be able to form a chemically selective sorbent film when exposed to UV radiation and cured (or crosslinked) by hydrosilylation and that Cavezzan's exposed and developed film and his substrate together would inherently be able to operate as an analytical device. Therefore, the prior art teaches present inventions of claims 1, 4, 9-11, 20-24, 43, 46, 205, 222, and 223.

With respect to present claim 226, in Cavezzan's Example 1, the film formed (from his organopolysiloxane composition) onto the surface of the silicon wafer is exposed to UV irradiation and then developed. Since the exposed and developed film is left on the surface of the silicon wafer (at least until the etching of the substrate is performed), the prior art teaches present step of claim 226, and thus teaches present invention of claim 226 (the recitation "for subsequent use to selectively absorb a first

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chemical species to which the film is exposed" merely recites the purpose of a process or the intended use of a structure).

With respect to present claim 227, since both of Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl end groups are also used in the embodiment of present Example 1, it is the Examiner's position that the present selecting step of claim 227 is *inherently taught* (i.e., inherently encompassed) by the prior art. Therefore, the prior art teaches present invention of claim 227.

12. Claims 1, 2, 4, 9-11, 20-24, 43, 46, and 205 are rejected under 35 U.S.C. 102(b) as being anticipated by Oxman et al (5,145,886).

Oxman teaches (see Example 1) a composition containing (i) a vinyl terminated polydimethylsiloxane which formula is shown in col.9, lines 30-36, (ii) a polydimethylpolymethylhydrosiloxane copolymer (wherein Si-H groups are located along the polymer chain) which formula is shown in col.9, lines 40-46, and (iii) a photohydrosilation catalyst which is a Pt(II) beta-diketonate complexes. Therefore, the prior art teaches present second precursor molecule of claims 1, 4, 9-11, 205, present first precursor molecule of claims 1, 20-24, 205, and present photoactivatable catalyst of claims 1, 2, and 205. After applying his hydrosilation composition to a substrate, the coated substrate is exposed to radiation in order to be cured (see col.8, lines 11-18, lines 53-60). Since Oxman teaches present components and method of claim 1, it is the Examiner's position that Oxman's composition will *inherently* form a chemically selective sorbent film (wherein the film has a glass-to-rubber transition temperature

below the operating temperature of the chemically selective sorbent film) when exposed to radiation and cured by hydrosilation and that Oxman's exposed film and his substrate together would inherently be able to operate as an analytical device as presently recited. Therefore, the prior art teaches present inventions of claims 1, 2, 4, 9-11, 20-24, 43, 46, 205, 222, and 223.

With respect to present claim 226, since in Oxman, his composition, that is coated onto a substrate and is later exposed and cured, remains on the substrate, the prior art teaches present limitation "leaving the chemically selective sorbent film in place on the substrate" and thus teaches present invention of claim 226 (the recitation "*for subsequent use* to selectively absorb a first chemical species to which the film is exposed;" merely recites the purpose of a process or the intended use of a structure).

With respect to present claim 227, since Oxman teaches present first and second precursor molecules, it is the Examiner's position that the present selecting step of claim 227 is inherently taught (i.e., inherently encompassed) by the prior art. Therefore, the prior art teaches present invention of claim 227.

13. Claims 232 and 233 are rejected under 35 U.S.C. 102(b) as being anticipated by Cavezzan et al (4,939,065).

Cavezzan teaches (col.1, lines 8-12. col.4, lines 15-38, Example 1) a UV-crosslinkable organopolysiloxane composition containing diorganopolysiloxane having at least 2 alkenyl unsaturation, which can be located at the end of the polymer chain. Specifically in Example 1, Cavezzan uses a polydimethylsiloxane polymer having dimethylvinylsiloxyl end groups (*which is the polymer also used in present Example 1*).

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Therefore, Cavezzan teaches present second precursor molecule of claim 232.

Cavezzan's organopolysiloxane composition also contains (col.3, line 37-62, col.4, lines 53-68, col.5, lines 1-6) a second component, an organohydropolysiloxane containing at least two hydrogen atoms bonded to a silicon atom wherein the SiH groups may be located within the polymer chain, and as one of only three examples, Cavezzan lists polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxyl end groups. Since there are only a few examples, one of ordinary skill in the art would immediately envisage the polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxyl end groups (*which is the polymer also used in present Example 1*) as Cavezzan's second component. Therefore, the prior art teaches present first precursor molecule of claim 232. Cavezzan's organopolysiloxane composition finally contains a platinum catalyst (col.3, lines 37-62, col.5, lines 45-56). Cavezzan teaches (col.3, lines 37-41) that his invention features, as a negative resist, a film-forming organopolysiloxane composition capable of being crosslinked by *hydrosilylation* in the presence of a catalyst derived from a platinum group metal. Cavezzan furthermore teaches (col.7, lines 59-68, col.8, lines 1-16, lines 42-50) that his substrate (e.g., silicon wafer) is coated with a uniform adherent film of his organopolysiloxane composition, and then the film formed is imagewise irradiated with UV radiation which will cause the exposed area to cure (thereby decreasing the solubility of the exposed area as presently recited in claim 232), while the unirradiated area remains soluble in organic solvents.

Since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups teaches present first precursor molecule and Cavezzan's

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polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups teaches present second precursor molecule, it is the Examiner's position that Cavezzan's film-forming organopolysiloxane composition that contains those components as well as the platinum catalyst (present photoactivatable catalyst) will *inherently* form a chemically selective sorbent film when exposed to UV radiation and cured (or crosslinked) by hydrosilylation.

With respect to present limitation "selecting a first precursor molecule . . . and a second precursor molecule . . . based upon a determination on that . . . more than a second chemical species", since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are *also used in the embodiment of present Example 1*, it is the Examiner's position that the present selecting step of claim 232 is *inherently taught* (i.e., inherently encompassed) by the prior art.

With respect to present limitation of claim 233, "leaving the chemically selective sorbent film in place on the substrate *for subsequent use to selectively absorb a first chemical species to which the film is exposed*," in Cavezzan's Example 1, the film formed (from his organopolysiloxane composition) onto the surface of the silicon wafer is exposed to UV irradiation and then developed. Since the exposed and developed film is left on the surface of the silicon wafer (at least until the etching of the substrate is performed), the prior art teaches present limitation "leaving the chemically selective sorbent film in place on the substrate". The recitation "*for subsequent use to selectively*

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absorb a first chemical species to which the film is exposed;" *merely recites the purpose of a process or the intended use of a structure.*

Therefore, the prior art teaches present inventions of claims 232 and 233.

Claim Rejections - 35 USC § 103

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavezzan et al (4,939,065) in view of Oxman et al (5,145,886).

Cavezzan is discussed in Paragraph 11 above. Cavezzan does not teach present Pt(II) bis(beta-diketonates). Oxman teaches (col.3, lines 22-40) that when Pt(II) beta-diketonate complex is used as hydrosilation catalyst, the reaction composition will not react prematurely in the absence of actinic radiation, the reaction composition allows the cure of unusually thick section of material, and low levels of the catalyst can be used. In view of Oxman's teaching, it would have been obvious to one of ordinary skill in the art to use Pt(II) beta-diketonate complex as Cavezzan's hydrosilation catalyst in order to take those advantages of using such catalyst as taught by Oxman.

Therefore, Cavezzan in view of Oxman would render obvious present invention of claim 2.

15. Claims 212 and 213 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavezzan et al (4,939,065) in view of Oxman et al (5,145,886) and Oaks et al (6,083,661).

Cavezzan is discussed above in Paragraph 11. Cavezzan does not teach present modifying step of claim 212. Oxman teaches (col.8, lines 53-67) that when a hydrosilation composition is applied to the surface of a solid substrate, it is often

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advantageous to prime the surface of the substrate to which the hydrosilation composition is to be applied to *improve the adhesion* of the composition to the substrate. Oxman furthermore states that many primers are described in the art and should be chosen on the basis of the substrate to be used. As discussed above, Cavezzan's substrate is a silicon wafer. Oaks teaches (see col.19, lines 36-47) cleaning of a silicon wafer and then treating it with a primer, such as *triethoxyvinylsilane* (as an adhesion promoter). In view of the teachings of Oxman and Oaks, it would have been obvious to one of ordinary skill in the art to clean Cavezzan's silicon wafer and then treat it with *triethoxyvinylsilane* (present coupling agent having a carbon-carbon multiple bond) before the hydrosilation composition is applied to the wafer so as to improve the adhesion of the hydrosilation composition to the silicon wafer as taught by Oxman and Oaks. Therefore, Cavezzan in view of Oxman and Oaks would render obvious present inventions of claims 212 and 213 (since triethoxyvinylsilane is the present coupling agent having a carbon-carbon multiple bond, when one treats Cavezzan's substrate surface with triethoxyvinylsilane, it would inherently modify the surface to include a plurality of reactive groups effective to participate in the hydrosilylation reaction as presently recited in claim 212).

16. Claims 48-50, 101, 224, 225, 228, and 229 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavezzan et al (4,939,065) in view of Oxman et al (5,145,886) and Oaks et al (6,083,661).

Cavezzan teaches (col.1, lines 8-12. col.4, lines 15-38, Example 1) a UV-crosslinkable organopolysiloxane composition containing diorganopolysiloxane having

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at least 2 alkenyl unsaturation, which can be located at the end of the polymer chain. Specifically in Example 1, Cavezzan uses a polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups (which is the polymer also used in present Example 1). Therefore, Cavezzan teaches present second precursor molecule. Cavezzan's organopolysiloxane composition also contains (col.3, line 37-62, col.4, lines 53-68, col.5, lines 1-6) a second component, an organohydropolysiloxane containing at least two hydrogen atoms bonded to a silicon atom wherein the SiH groups may be located within the polymer chain, and as one of only three examples, Cavezzan lists *polydimethylpolymethylhydrosiloxane copolymers* having trimethylsiloxyl end groups. Since there are only a few examples, one of ordinary skill in the art would immediately envisage the polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxyl end groups (which is the polymer also used in present Example 1) as Cavezzan's second component. Therefore, the prior art teaches present first precursor molecule.

Cavezzan's organopolysiloxane composition finally contains a platinum catalyst (col.3, lines 37-62, col.5, lines 45-56). Therefore, the prior art teaches present photoactivatable catalyst.

Cavezzan teaches (col.3, lines 37-41) that his invention features, as a negative resist, a film-forming organopolysiloxane composition capable of being crosslinked by *hydrosilylation* in the presence of a catalyst derived from a platinum group metal. Cavezzan furthermore teaches (col.7, lines 59-68, col.8, lines 1-16, lines 42-50) that his substrate (e.g., silicon wafer) is coated with a uniform adherent film of his organopolysiloxane composition, and then the film formed is imagewise irradiated with

UV radiation which will cause the exposed area to cure (thereby decreasing the solubility of the exposed area as presently recited in claim), while the unirradiated area remains soluble in organic solvents.

Since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are also used in the embodiment of present Example 1, it is the Examiner's position that Cavezzan's film-forming organopolysiloxane composition that contains those components as well as the platinum catalyst (present photoactivatable catalyst) will *inherently* form a chemically selective sorbent film (which will selectively absorb chemical species when exposed to such chemical species) when exposed to UV radiation and cured (or crosslinked) by hydrosilylation and that Cavezzan's exposed and developed film and his substrate together would inherently be able to operate as an analytical device. Therefore, Cavezzan teaches present inventions of claims 48, 101, 224, and 225 except for the present step of cleaning the substrate and reacting a coupling agent with the surface of the substrate that appends to the surface reactive groups that can participate in hydrosilylation reactions.

Oxman teaches (col.8, lines 53-67) that when a hydrosilation composition is applied to the surface of a solid substrate, it is often advantageous to prime the surface of the substrate to which the hydrosilation composition is to be applied *to improve the adhesion* of the composition to the substrate. Oxman furthermore states that many primers are described in the art and should be chosen on the basis of the substrate to be used. As discussed above, Cavezzan's substrate is a silicon wafer. Oaks teaches

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(see col.19, lines 36-47) cleaning of a silicon wafer and then treating it with a primer, such as *triethoxyvinylsilane* (as an adhesion promoter). In view of the teachings of Oxman and Oaks, it would have been obvious to one of ordinary skill in the art to clean Cavezzan's silicon wafer and then treat it with *triethoxyvinylsilane* (which is present coupling agent having a carbon-carbon multiple bond) before the hydrosilation composition is applied to the wafer so as to improve the adhesion of the hydrosilation composition to the silicon wafer as taught by Oxman and Oaks. Therefore, Cavezzan in view of Oxman and Oaks would render obvious present inventions of claims 48-50, 101, 224, and 225 (since triethoxyvinylsilane is the present coupling agent having a carbon-carbon multiple bond, when one treats Cavezzan's substrate surface with triethoxyvinylsilane, it would inherently append to the surface reactive groups that can participate in hydrosilylation reactions as presently recited in claim 48).

With respect to present claim 228, in Cavezzan's Example 1, the film formed (from his organopolysiloxane composition) onto the surface of the silicon wafer is exposed to UV irradiation and then developed. Since the exposed and developed film is left on the surface of the silicon wafer (at least until the etching of the substrate is performed), Cavezzan teaches present step of claim 228, and thus Cavezzan in view of Oxman and Oaks would render obvious present invention of claim 228 (the recitation "for subsequent use to selectively absorb a first chemical species to which the film is exposed" merely recites the purpose of a process or the intended use of a structure).

With respect to present claim 229, since both of Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and

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Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are also used in the embodiment of present Example 1, it is the Examiner's position that the present selecting step of claim 229 is *inherently taught* (i.e., inherently encompassed) by Cavezzan. Therefore, Cavezzan in view of Oxman and Oaks would render obvious present invention of claim 229.

17. Claims 215-218 and 220 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavezzan et al (4,939,065) in view of Oxman et al (5,145,886) and Oaks et al (6,083,661).

Cavezzan teaches (col.1, lines 8-12. col.4, lines 15-38, Example 1) a UV-crosslinkable organopolysiloxane composition containing diorganopolysiloxane having *at least 2 alkenyl unsaturation* (preferably vinyl unsaturation), which can be located at the end of the polymer chain. Specifically, in Example 1, Cavezzan uses a polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups (which is the polymer also used in present Example 1). Therefore, Cavezzan teaches present second precursor molecule of claim 215.

Cavezzan's organopolysiloxane composition also contains (col.3, line 37-62, col.4, lines 53-68, col.5, lines 1-6) a second component, an organohydropolysiloxane containing *at least two hydrogen atoms bonded to a silicon atom* wherein the SiH groups may be located within the polymer chain, and as one of only three examples, Cavezzan lists *polydimethylpolymethylhydrosiloxane copolymers* having trimethylsiloxyl *end* groups (*which indicates that the SiH groups are located not at the chain ends of the polymer but within the polymer chain*). Since there are only a few examples, one of

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ordinary skill in the art would immediately envisage the polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxyl end groups (which is the polymer also used in present Example 1) as Cavezzan's second component. Therefore, the prior art teaches present first precursor molecule of claim 215.

Cavezzan's organopolysiloxane composition finally contains a platinum catalyst (col.3, lines 37-62, col.5, lines 45-56). Therefore, the prior art teaches present photoactivatable catalyst of claim 215.

Cavezzan teaches (col.3, lines 37-41) that his invention features, as a negative resist, a film-forming organopolysiloxane composition capable of being crosslinked by *hydrosilylation* in the presence of a catalyst derived from a platinum group metal. Cavezzan teaches (col.7, lines 59-68, col.8, lines 1-16, lines 42-50) that his substrate (e.g., silicon wafer) is coated with a uniform adherent film of his organopolysiloxane composition, and then the film formed is imagewise irradiated with UV radiation, which will cause the exposed area to cure, while the unirradiated area remains soluble in organic solvents.

Since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups teaches present first precursor molecule and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups teaches present second precursor molecule, it is the Examiner's position that Cavezzan's film-forming organopolysiloxane composition that contains those components as well as the platinum catalyst (present photoactivatable catalyst) will *inherently* be a chemically

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selective sorbent film useful as a chemical sensor, wherein the chemically selective sorbent film has a glass-to-rubber transition temperature below the operating temperature of the chemical sensor, as presently recited in claims 215 and 216.

Therefore, Cavezzan teaches present inventions of claims 215 and 216 except for the present step of cleaning the substrate and reacting a coupling agent with the surface of the substrate, said coupling agent including a reactive group such as a silicon hydride group, a carbon-carbon multiple bond, or each of the silicon hydride group and a carbon-carbon multiple bond. Oxman teaches (col.8, lines 53-67) that when a hydrosilation composition is applied to the surface of a solid substrate, it is often advantageous to prime the surface of the substrate to which the hydrosilation composition is to be applied *to improve the adhesion* of the composition to the substrate. Oxman furthermore states that many primers are described in the art and should be chosen on the basis of the substrate to be used. As discussed above, Cavezzan's substrate is a silicon wafer. Oaks teaches (see col.19, lines 36-47) cleaning of a silicon wafer and then treating it with a primer, such as *triethoxyvinylsilane* (as an adhesion promoter). In view of the teachings of Oxman and Oaks, it would have been obvious to one of ordinary skill in the art to clean Cavezzan's silicon wafer and then treat it with *triethoxyvinylsilane* (present coupling agent having a carbon-carbon multiple bond) before the hydrosilation composition is applied to the wafer so as to improve the adhesion of the hydrosilation composition to the silicon wafer as taught by Oxman and Oaks. Therefore, Cavezzan in view of Oxman and Oaks would render obvious present inventions of claims 215 and 216.

With respect to present claims 217, 218 and 220, the present claim language does not require that the first chemically selective sorbent film has a different functionality than the second film (nor does it require that the first composition and the second composition are different in chemical nature). Therefore, it is the Examiner's position that Cavezzan in view of Oxman and Oaks would also render obvious present inventions of claims 217, 218, and 220, since Cavezzan's process of pattern formation would surely be practiced over and over again, and each time the process is practiced, the produced patterned film will be at a physically different location than the one which has been produced earlier. *It is to be noted that present claim 217 does not state that a single substrate contains separate domains of different chemically selective sorbent films (as in claims 204 and 221).*

18. Claims 234 and 235 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavezzan et al (4,939,065) in view of Oxman et al (5,145,886) and Oaks et al (6,083,661).

Cavezzan teaches (col.1, lines 8-12. col.4, lines 15-38, Example 1) a UV-crosslinkable organopolysiloxane composition containing diorganopolysiloxane having *at least 2* alkenyl unsaturation (preferably vinyl unsaturation), which can be located at the end of the polymer chain. Specifically, in Example 1, Cavezzan uses a polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups (which is the polymer also used in present Example 1). Therefore, Cavezzan teaches present second precursor molecule of claim 234.

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Cavezzan's organopolysiloxane composition also contains (col.3, line 37-62, col.4, lines 53-68, col.5, lines 1-6) a second component, an organohydropolysiloxane containing *at least two hydrogen atoms bonded to a silicon atom* wherein the SiH groups may be located within the polymer chain, and as one of only three examples, Cavezzan lists *polydimethylpolymethylhydrosiloxane copolymers* having trimethylsiloxy end groups. Since there are only a few examples, one of ordinary skill in the art would immediately envisage the polydimethylpolymethylhydrosiloxane copolymers having trimethylsiloxy end groups (which is the polymer also used in present Example 1) as Cavezzan's second component. Therefore, the prior art teaches present first precursor molecule of claim 234.

Cavezzan's organopolysiloxane composition finally contains a platinum catalyst (col.3, lines 37-62, col.5, lines 45-56). Therefore, the prior art teaches present photoactivatable catalyst of claim 234.

Cavezzan teaches (col.3, lines 37-41) that his invention features, as a negative resist, a film-forming organopolysiloxane composition capable of being crosslinked by *hydrosilylation* in the presence of a catalyst derived from a platinum group metal. Cavezzan teaches (col.7, lines 59-68, col.8, lines 1-16, lines 42-50) that his substrate (e.g., silicon wafer) is coated with a uniform adherent film of his organopolysiloxane composition, and then the film formed is imagewise irradiated with UV radiation, which will cause the exposed area to cure, while the unirradiated area remains soluble in organic solvents.

Since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups teaches present first precursor molecule and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups teaches present second precursor molecule, it is the Examiner's position that Cavezzan's film-forming organopolysiloxane composition that contains those components as well as the platinum catalyst (present photoactivatable catalyst) will *inherently* form a chemically selective sorbent film.

With respect to present limitation "selecting a first precursor molecule . . . and a second precursor molecule . . . based upon a determination on that . . . more than a second chemical species", since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are *also used in the embodiment of present Example 1*, it is the Examiner's position that the present selecting step of claim 234 is *inherently taught* (i.e., inherently encompassed) by the prior art.

With respect to present limitation of claim 235, "leaving the chemically selective sorbent film in place on the substrate *for subsequent use to selectively absorb a first chemical species to which the film is exposed*;", in Cavezzan's Example 1, the film formed (from his organopolysiloxane composition) onto the surface of the silicon wafer is exposed to UV irradiation and then developed. Since the exposed and developed film is left on the surface of the silicon wafer (at least until the etching of the substrate is performed), the prior art teaches present limitation "leaving the chemically selective sorbent film in place on the substrate". The recitation "*for subsequent use to selectively*

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absorb a first chemical species to which the film is exposed;" *merely recites the purpose of a process or the intended use of a structure.*

Therefore, Cavezzan teaches present inventions of claims 234 and 235 except for the present step of cleaning the substrate and reacting a coupling agent with the surface of the substrate that appends to the surface reactive groups that can participate in hydrosilylation reactions. Oxman teaches (col.8, lines 53-67) that when a hydrosilation composition is applied to the surface of a solid substrate, it is often advantageous to prime the surface of the substrate to which the hydrosilation composition is to be applied *to improve the adhesion* of the composition to the substrate. Oxman furthermore states that many primers are described in the art and should be chosen on the basis of the substrate to be used. As discussed above, Cavezzan's substrate is a silicon wafer. Oaks teaches (see col.19, lines 36-47) cleaning of a silicon wafer and then treating it with a primer, such as *triethoxyvinylsilane* (as an adhesion promoter). In view of the teachings of Oxman and Oaks, it would have been obvious to one of ordinary skill in the art to clean Cavezzan's silicon wafer and then treat it with *triethoxyvinylsilane* (which is the coupling agent exemplified on pr.24 of present specification) before the hydrosilation composition is applied to the wafer so as to improve the adhesion of the hydrosilation composition to the silicon wafer as taught by Oxman and Oaks. Therefore, Cavezzan in view of Oxman and Oaks would render obvious present inventions of claims 234 and 235 (since triethoxyvinylsilane is also mentioned in present specification, it is the Examiner's position that the

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triethoxyvinylsilane would inherently append to the surface of the silicon wafer reactive groups that can participate in hydrosilylation reactions as presently recited in claim 234).

Allowable Subject Matter

19. Claims 103, 104, 106, 147, 148, 208-211, and 230 are allowed. Claims 149-151, 153, 154, 202, 203, and 231 are allowed. The amended claims 103 and 149 now require the active step of "using the chemically selective sorbent film by exposing the film to a first chemical species that the film will selectively absorb", and Cavezzan'065 does not teach or suggest such a step.

20. Claims 204 and 221 are allowed. None of the cited prior art teaches or suggests the step of repeating the processes of imagewise exposure and development using new composition at different locations (on a single substrate) each time as presently recited in claim 204. Also, none of the cited prior art teaches or suggests the method of present claim 221 for forming several individual domains of chemically selective sorbent films on a single substrate.

21. Claim 219 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Cavezzan does not teach or suggest present first chemically selective sorbent film, which has a different functionality than the second chemically selective sorbent film.

Response to Arguments

22. Applicants argue that Cavezzan or Oxman does not disclose any method or device in which the substrate and the film together are operable as an analytical device.

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Applicants argue that in Cavezzan, the resist layer serves a transient purpose as a barrier during fabrication and is then discarded and that Oxman states that an important application of the process and compositions of the invention is as a visible light curable impression material or dental applications. However, Cavezzan states that after the imagewise exposure and development, "[i]t is then *possible* to rinse . . . , *and then to* carry out an etching process . . ." That is, an etching step is not necessarily required in Cavezzan's microlithography process. As discussed above, since Cavezzan's polydimethylpolymethylhydrosiloxane copolymer having trimethylsiloxyl end groups and Cavezzan's polydimethylsiloxane polymer having dimethylvinylsiloxyl *end* groups are also used in the embodiment of present Example 1, it is the Examiner's position that Cavezzan's exposed and developed film and his substrate together would *inherently* be able to operate as an analytical device (as long as the etching step is not performed or at least until the etching step is performed). Also, with respect to Oxman, the reference clearly state that his composition is useful for preparing dental impressions, adhesives, release liners, gaskets, caulking materials, and *coatings*. That is, Oxman's composition is not just for preparing dental impressions. As discussed above, since Oxman teaches present components and method of claim 1, it is the Examiner's position that Oxman's composition will *inherently* form a chemically selective sorbent film when exposed to radiation and cured by hydrosilation and that Oxman's exposed film and his substrate together would inherently be able to operate as an analytical device.

Applicants furthermore states that "*as described in the present specification*", for an analytical device of the invention to be operable, two important features need to

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exist: (1) a chemically selective sorbent film that has an affinity to one or more select chemical species, and (2) *a substrate configured to detect the presence of the chemical species in the film, for example, by detecting a physical change in the film when the chemical species is present.* First of all, the Examiner could not locate such statement in the original disclosure. Secondly, since both Cavezzan and Oxman use the same or similar materials as in present Example 1, the radiation-exposed films of both Cavezzan and Oxman would inherently have an affinity to one or more select chemical species. Also, it is to be noted that Cavezzan uses a silicon wafer, which is the same substrate material used in present Example 1, and thus, Cavezzan's substrate would inherently be configured *to detect the presence of the chemical species in the film, for example, by detecting a physical change in the film when the chemical species is present.*

Applicants argue that none of the cited references teaches or suggests present step of "selecting a first precursor molecule containing at least two silicon hydride groups and a second precursor molecule containing at least two carbon-carbon multiple bonds based upon a determination that at least one of said first and second precursor molecules has a chemically interactive property that is retained after a chemically selective sorbent film is formed by a hydrosilylation reaction between said first and second precursor molecules and that provides to the film a functionality whereby the film selectively absorbs a first chemical species more than a second chemical species.". Even if the Examiner gives patentable weight to the selecting step described above, it is still the Examiner's position that the present selecting step is ***inherently taught or***

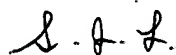
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encompassed by Cavezzan and Oxman since both Cavezzan and Oxman **pick and use** the same materials used in the embodiment of present Example 1.

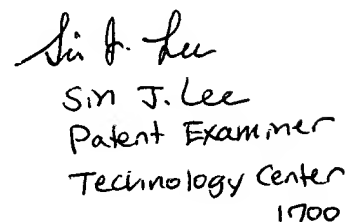
23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
February 7, 2005



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